

WHAT IS CLAIMED IS:

1. A method of identifying a clean speech signal from a noisy speech signal, the method comprising:
  - 5 identifying a set of frequency values that represent the noisy speech signal;  
determining parameters of at least one posterior probability distribution of at least one component of a clean  
10 signal value based on the set of frequency values without applying a frequency-based transform to the set of frequency values; and  
using the parameters of the posterior  
15 probability distribution to estimate a set of frequency values for a clean speech signal.
2. The method of claim 1 wherein the set of  
20 frequency values for the clean speech signal comprises a set of log-magnitude values.
3. The method of claim 2 further comprising taking the exponent of each of the log-magnitude  
25 values in the set of log-magnitude values to produce a set of magnitude values for the clean speech signal.
4. The method of claim 3 further comprising  
30 transforming the set of magnitude values for the

clean speech signal into a set of time domain values representing a frame of the clean speech signal.

5.           The method of claim 4 further comprising  
5 transforming a frame of the noisy speech signal into the frequency domain to form the frequency values for the noisy speech signal.

6.           The method of claim 5 wherein transforming  
10 a frame of the noisy speech signal into the frequency domain further comprises generating a set of frequency phase values and wherein transforming the set of magnitude values for the clean speech signal into a set of time domain values further comprises  
15 using the set of frequency phase values to transform the set of magnitude values.

7.           The method of claim 1 further comprising  
applying a time-based filter to each of the frequency  
20 values that represent the noisy speech signal, the time-based filter utilizing at least two frames of frequency values during a single filter operation.

8.           The method of claim 7 wherein the time-  
25 based filter comprises a Finite Impulse Response filter.

9.           The method of claim 5 wherein transforming  
a frame of the noisy speech signal into the frequency

domain comprises producing a set of more than one hundred frequency magnitude values.

10.           The method of claim 1 wherein determining  
5   the parameters of at least one posterior probability distribution comprises utilizing an iterative process to determine the parameters.

11.           The method of claim 1 wherein determining  
10   parameters of at least one posterior distribution comprises determining parameters for each of a set of mixture components.

12.           A computer-readable medium having computer-  
15   executable instructions for performing steps comprising:

                  determining a posterior probability based  
                          on logarithms of frequency values that  
                          represent a frame of a noisy speech  
20                   signal, wherein a frequency-based transform is not applied to the  
                          logarithms of frequency values before  
                          the logarithms of frequency values are  
                          used to determine the posterior  
25                   probability; and  
                  using the posterior probability to estimate  
                          a frame of a clean speech signal.

13.           The computer-readable medium of claim 12  
30   wherein estimating a frame of a clean speech signal

comprises estimating log-magnitude frequency values for the frame of the clean speech signal.

14. The computer-readable medium of claim 13  
5 further comprising taking the exponent of the log-magnitude frequency values to form magnitude values.

15. The computer-readable medium of claim 14  
further comprising transforming the magnitude values  
10 into time-domain values representing a frame of the clean speech signal.

16. The computer-readable medium of claim 15  
wherein transforming the magnitude values comprises  
15 performing an inverse Fast Fourier Transform.

17. The computer-readable medium of claim 16  
wherein performing an inverse Fast Fourier Transform  
further comprises using phase values generated by  
20 converting the frame of the noisy speech signal from the time domain to the frequency domain.

18. The computer-readable medium of claim 12  
wherein determining a posterior probability comprises  
25 using an iterative process to determine the posterior probability.

19. The computer-readable medium of claim 12  
wherein determining a posterior probability comprises

determining a separate posterior probability for each mixture component in a set of mixture components.

20.           The computer-readable medium of claim 12  
5 wherein determining a posterior probability comprises filtering the logarithms of the frequency values over time and using the filtered logarithms to determine the posterior probability.